

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A method of determining impulse responses of a medium (2) in relation to the transmission of waves between different points (~~T1-TN~~), method comprising:

(a) at least one step of emission in the course of which waves are emitted into the medium (2) by generating signals $e_i(t)$ on the basis of a number N of emission points (~~T1-TN~~) belonging to the medium, where N is an integer at least equal to 2 and i is an index lying between 1 and N which designates one of said N emission points,

(b) at least one step of reception in the course of which signals $r_j(t)$ are picked up from said waves after transmission in said medium, at a number M of reception points (~~T1-TN~~) belonging to the medium, where M is a non-zero natural integer and j is an index lying between 1 and M which designates one of said M reception points,

(c) and at least one step of determination of said impulse responses $h_{ij}(t)$ between each emission point i and each reception point j on the basis of the signals emitted $e_i(t)$ and picked up $r_j(t)$,

~~characterized in that in~~ wherein during the course of step (a), said N emission points (~~T1-TN~~) are made to simultaneously emit the signals $e_i(t)$, these signals $e_i(t)$ having a duration T and each being a sum of n substantially monochromatic elementary signals, of like amplitude and of respective frequencies $f_{0,i} + k \cdot \delta f$, where $f_{0,i}$ is a predetermined eigenfrequency at the point i , k is an integer lying between 0 and n , n is an integer at least equal to 2 and δf is a predetermined frequency interval, the respective eigenfrequencies $f_{0,i}$ at the various points i being distinct and lying in a frequency band of width δf ,

and ~~in that in~~ wherein during the course of step (c), each impulse response $h_{ij}(t)$ is calculated on the basis of a signal of correlation between the signal $e_i(t)$ emitted at the point i and the signal $r_j(t)$ picked up at the point j .

2. (Original) The method as claimed in claim 1, in which the respective eigenfrequencies $f_{0,i}$ at the various points i are separated pairwise by an offset $\delta f/N$.

3. (Currently Amended) The method as claimed in claim 1 ~~or claim 2~~, in which, in the course of step (c), said correlation signal is windowed by means of a gate function $\pi(t)$ of width $1/\delta f$.

4. (Original) The method as claimed in claim 3, in which, in the course of step (c), the impulse responses $h_{ij}(t)$ are determined through the formula:

$$h_{ij}(t) = \Pi(t) \cdot \int e^{i(\theta - t)} \cdot r_j(\theta) d\theta.$$

5. (Currently Amended) The method as claimed in claim 1 ~~any one of the preceding claims~~, in which the waves transmitted in the medium between the emission points and the reception points are acoustic waves.

6. (Currently Amended) The method as claimed in claim 1 ~~any one of the preceding claims~~, in which, in the course of step (a), the medium where the waves are emitted is reverberant.

7. (Currently Amended) The method as claimed in claim 1 ~~any one of the preceding claims~~, in which the frequency interval δf is less than or equal to $1/\tau$, where τ is the temporal dispersion of the medium.

8. (Original) The method as claimed in claim 7, in which the frequency interval δf is substantially equal to $1/\tau$, where τ is the temporal dispersion of the medium.

9. (Currently Amended) The method as claimed in claim 1 ~~any one of the preceding~~ ~~claims~~, in which the duration T is at least equal to $N/\delta f$.

10. (Currently Amended) The method as claimed in claim 1 ~~any one of the preceding~~ ~~claims~~, in which the duration T is at least equal to $N \cdot \tau$, where τ is the temporal dispersion of the medium.

11. (Currently Amended) The method as claimed in claim 1 ~~any one of the preceding~~ ~~claims~~, in which the elementary signals exhibit random phases.

12. (Currently Amended) The method as claimed in claim 1 ~~any one of the preceding~~ ~~claims~~, in which the waves are emitted with a certain passband, the frequencies f_{0i} comprise a minimum frequency f_0 and the number n is determined so that the frequency band lying between f_0 and $f_0 + [(n+1) \cdot \delta f]$ substantially overlaps said passband.

13. (Currently Amended) The method as claimed in claim 1 ~~any one of the preceding~~ ~~claims~~, in which the reception points are coincident with the emission points (T_1 - T_N).